

REMARKS

Claims 1-5 and 7-19 are pending in this application. Of those claims, claims 11, 12, and 17-19 have been withdrawn from consideration pursuant to the provisions of 37 C.F.R. §1.142(b).

In this Amendment, claim 1 has been amended to clarify the claimed subject matter. Care has been exercised not to introduce new matter.

Claims 1-5, 7-10, and 13-16 are now active in this application, of which claim 1 is independent.

Claim Rejection– 35 U.S.C. § 102

Claims 1-5, 7, 8, and 10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Japanese Patent Application Publication No. 09-296214 (“JP’214”). Applicants submit that the JP’214 does not identically disclose a manufacturing method including all the limitations recited in independent claim 1, which reads:

1. A manufacturing method of a thin component, including the steps of
heating a thin component, and thereafter, while sizing with molds and using said molds as cooling media of said thin component, performing a quenching process on said thin component, wherein
after said thin component is quenched, said thin component is tempered using said molds as temperature controlling media, and
said quenching process causes a martensitic transformation.

According to the claimed manufacturing method, the thin component can be quenched and tempered using the molds as temperature controlling media. The term “quenching” means heating steel to an austenitic structure, and then rapidly cooling it in any of various types of cooling media, in order to generate a martensitic structure.¹ Further, the term “tempering” refers

¹ See Exhibit A, attached to the Amendment dated October 10, 2008.

to an operation of heating the martensitic structure generated by quenching of steel to a temperature equal to or lower than A₁ point, and cooling the same.²

In the first full paragraph on page 4 of the Office Action, the Examiner asserted that the JP'214 teaches carrying out the “tempering” process described in paragraph [0021] (heating to the austempering temperature) after the “quenching” described in paragraphs [0054]-[0057]. Applicants emphasize that the Examiner's assertion is technologically illogical for the following reasons.

As discussed in the October 10, 2008 Amendment, in the JP'214, the “quenching” is described only in the description of the third embodiment that uses an apparatus shown in Fig. 6 (see paragraphs [0053]-[0059]). Fig. 6 shows apparatus 6 that has bainitizing portion 601 and martensitizing portion 602. In apparatus 6, martensitizing portion 602 that requires tempering is provided with cooling pipe 64 for allowing cooling water to pass therethrough, and is not provided with a heating portion such as a heater for heating martensitizing portion 602. Therefore, with this apparatus, it is not possible to heat martensitizing portion 602 after a quenching process and perform a tempering process.

Furthermore, if heater 63 at bainitizing portion 601 were used to heat martensitizing portion 602, a bainitic structure of bainitizing portion 601 would be affected adversely.

Accordingly, carrying out the “tempering” process on bainitizing portion 601 (heating to the austempering temperature) as described in paragraph [0021] of the JP'214 after the “quenching” of martensitizing portion 602 as described in paragraphs [0054]-[0057] in the JP'214 adversely affects a bainitic structure and is contrary to the original purpose of the JP'214, and hence is technically illogical.

² *Id.* at 544.

The Examiner further indicated “quenching while holding at a certain temperature (Abstract of the JP’214)” in the first full paragraph on page 4 of the Office Action. As pointed out by the Examiner, the English-language abstract of the JP’214 does include the word “quenching.”³ However, the word “quenching” in the English-language abstract means rapidly cooling a material to be treated while holding the material to be treated between forming heat treatment dies set at temperature T1 lower than austempering temperature T2 (i.e. a temperature higher than the martensitic transformation point). Therefore, the word “quenching” in the English-language abstract of the JP’214 does not correspond to the claimed quenching that causes a martensitic structure.

Based on the foregoing, the JP’214 does not identically disclose a manufacturing method including all the limitations recited in independent claim 1, as amended. Dependent claims 2-5, 7, 8, and 10 are also patentably distinguishable over the JP’214 at least because these claims respectively include all the limitations recited in independent claim 1. Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims and favorable consideration thereof.

Claim Rejection– 35 U.S.C. § 103

Claims 9 and 13-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the JP’214 in view of Grell et al. (U.S. Patent No. 6,682,227, hereinafter “Grell”).

³ The following is excerpted from the English-language abstract of the JP’214, which is available at the Japan Patent Office’s website at <http://www4.ipdl.inpit.go.jp/Tokujitu/tjsogodben.ipdl?N0000=115> (emphasis added).

PROBLEM TO BE SOLVED: To provide a method and an equipment for solid forming austempering treatment, capable of performing quenching at sufficient cooling velocity without causing distortion even in the case of a relatively thick material to be treated and also capable of securing desired austempering temp.

SOLUTION: A material to be treated is heated to a temp. in the austenite region (not lower than the A point). Then, the material to be treated is quenched while holding this material to be treated between forming heat treatment dies having a temp. set at the temp. T1 lower than the desired austempering temp. T2. Subsequently, the forming heat treatment dies are heated to the austempering temp. T2 and the material to be treated is held at the austempering temp. T2, and bainitic transformation is allowed to occur.

Claims 9 and 13-16 depend on independent claim 1. Applicants thus incorporate herein the arguments made in response to the rejection of independent claim 1 under 35 U.S.C. § 102(b) for anticipation evidenced by the JP'214. The Examiner's additional comments and secondary reference to Grell do not cure the deficiencies of the JP'214. Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims and favorable consideration thereof.

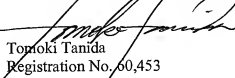
Conclusion

In view of the above remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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